# New Rotor for Curing Measurements



## Investigation of Curing Behavior with a Newly Designed Ring Rotor

To predict the rheological properties of adhesives and sealants in industrial applications, determination of curing behavior is of utmost importance.
A major problem is that an adhesive curing under ambient air conditions tends to create a skin after a short time.
When using a standard measuring geometry, e.g. plate-plate, with a HAAKE MARS, RheoStress 1 or RheoStress 600 rheometer, curing behavior can not be monitored correctly via small amplitude oscillatory shear tests, as the skin insulates the sample from air moisture (Figure 1).
This setup results in only a minor increase of the storage modulus G' with time due to the skinning influence.

Therefore a new rotor for the investigation of the curing behavior of such systems was developed (Figure 2).

The principle of this rotor is based on minimizing the sample volume while simultaneously maximizing the contact surface of the sample. Even though skinning behavior still occurs, air moisture can be transported into the sample via enhanced diffusion processes.
The experiment results also can be seen in Figure 1. With this new setup the storage modulus G' rises approximately one order of magnitude over the observed timeframe of 24 h.


## Keywords

- HAAKE MARS Rheometer
- HAAKE RheoStress 1
- Ring Rotor
- Adhesives
- Sealants
- Curing Behavior
- Skinning


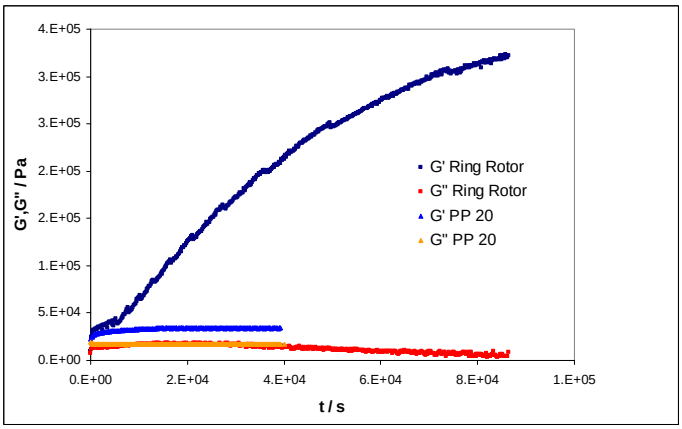


Figure 1: Storage modulus G' and loss modulus G" versus time for a polyurethane sealant, determined with a) 20 mm plate-plate geometry and b) newly designed ring rotor at ambient conditions, f = 1 Hz, $\gamma$ = 1 %.

Figure 2: Newly designed ring rotor (order number 222-1789)


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